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EVALUATION OF EYE AND LID MOVEMENT CHARACTERISTICS DURING BLINK REFLEX USING SCLERAL SEARCH COIL

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*Purpose* : Blink reflexes evoked with corneal sensation or flash light stimulation are widely performed to examine optic, trigeminal and facial nerve. Both the electro-oculographic findings of lid movements and scleral search coil findings of eye movements during those blinks were investigated previously, we studied both eye and lid movement simultaneously with special reference to the co-ordination of those movements evoked with several stimuli and compared them with those of voluntary blink.
*Methods* : Eye and lid movement was studied in five normal subjects. The data was obtained using scleral search coil ; Enzanshi-Kogyo MEL24. And the records were digitized and estimated using San-Ei Signal Processor 7T18. Program was written in the Basic.
*Results* : The amplitude of eye movements shows 7.9±6.8deg, 9.0±15.0deg, 6.2±6.0deg, velocity shows 226.9±150.0deg/sec, 228.9±202.6deg/sec, 140.3±45.4 deg/sec, duration shows 158.0±74.9 ms, 162.9±90.2 ms, 118.6±49.2 ms under voluntary blink, corneal touch stimulation and light stimulation respectively. Those for lid movements shows 11.1±8.5deg, 3.9±3.8deg, 5.0±5.8deg, velocity shows 204.2±131.7deg/sec, 162.3±70.0deg/sec, 123.6±64.9 deg/sec, duration shows 154±55.1ms, 165.0±57.8ms, 150.4±65.9ms under voluntary blink, corneal touch stimulation and light stimulation respectively.
*Conclusions* : Peak velocity and amplitude of both eye and lid movements were decreased under corneal touch stimulation and flash light stimulation. It is interesting that both lid and eye movement are affected by changing of the stimulus.

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**DISTORTION INDUCED BY OPHTHALMIC LENSES**

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**Purpose**: Distortion is an optical aberration affecting the shape rather than the sharpness of images formed by the periphery of an ophthalmic lens. Data relative to distortion are scarce. This study was designed to predict the image geometry as it may be perceived by a lens wearer.
**Methods**: A trigonometrical skew ray tracing through the lens was used to calculate the distortion perceived during the observation of an object square grid located at 5 m from the subject's entrance pupil. The grid center was aligned on the optical axis of the lens and the eccentricity of each corner was 30x30°. Computations were performed for ophthalmic lenses having a power of ±2, ±5 and -10D, a refractive index of 1.61 and a design either spherical or aspheric. A vertex sphere of 27 mm and a vertex distance of 14 mm were assumed. Firstly, distortion was computed when the visual axis of the observer was superimposed with the optical axis of the lens (central static distortion [CSD] affecting peripheral vision), and secondly, when the visual axis was at an angle from the optical axis during the fixation of the middle of the lateral margin of the grid (lateral static distortion [LSD] affecting foveal vision).
**Results**: Lateral static distortion is slightly greater than central static distortion however both aberrations increase with the power of the lens. For a given dioptric value, LSD and CSD are larger for a convex lens than for a concave one. For a spherical design and a given power, both distortions increase as the front surface of the lens is flattened. The use of an aspheric design contributes to reduce LSD and CSD in comparison with a spherical design having the same front paraxial curve.
**Conclusions**: The correction of distortion induced by an ophthalmic lens would require an excessive bending of the front lens surface, which is unacceptable from a cosmetic point of view. This correction is not compatible with the front base curves selected for the control of dioptric off-axis aberrations. Lateral static distortion affecting foveal vision can be perceived and may be disturbing for high hyperopes or aphakic patients during ocular rotation behind the ophthalmic lens.